

The some detail.
plant extracts are a

[Technology](#), [Development](#)



The objective of the study was to test alkaloids extract from *Annona squamosa* plant as a corrosion inhibitor for C38 steel in molar hydrochloric acid. The used methods was potentiodynamic polarization and AC impedance. Acid solutions are extensively used in multiple industrial areas. The use of corrosion inhibitors in order to restrain the corrosion attack on steel has been studied in some detail.

Plant extracts are a bountiful source of naturally produced chemical compounds that are easily extracted. Though, synergistic effects affect the inhibition efficiency of the plants. The Annonaceae is a member of tropical plants that contain alkaloids . *Annona squamosa* is a member of the Annonaceae family and generally distributed in the tropics. This study focuses on anti-corrosion activity of alkaloids extract from *Annona squamosa* plant. In figure one, demonstrates the polarisation curves for C38 steel containing distinct concentrations of *Annona squamosa* extract. Polarization curves were performed in solution and in the presence of multiple concentrations of *Annona squamosa* extract. The anodic reactions of steel electrode corrosion constrained with the development of the *Annona squamosa* extract concentration.

The additional *Annona squamosa* extract restrained the cathodic reaction to a larger extent than the anodic one. This reflects the increase of *Annona squamosa* extract which reduced anodic dissolution. Tafel lines with approximately equal slopes were obtained, confirming that that the hydrogen evolution reaction was controlled by activation. The constancy of this cathodic slope implied that the structure of the proton discharge reaction did not have an influence by the increase of *Annona squamosa*

extract. In figure two, demonstrates nyquist plots for C38 steel in the absence and presence of multiple concentrations of *Annona squamosa* extract. Common sets of Nyquist plots for C38 steel in solution that were uninhibited and inhibited acidic solutions containing distinct concentrations of *Annona squamosa* extract at room temperature was plotted.

Nyquist plots that all most of the delayed spectra obtained for the corrosion of C38 steel in solutions with constrained consist of two capacitive loops. The smaller loops have high-frequency due to the film that forms at the steel surface. Meanwhile larger loops have low-frequency due to the charge transfer reaction. In figure three, demonstrates bode plots in phase angles compared to freq and LogZ compared to freq in the absence and presence of different concentrations of *Annona squamosa* extract. In consideration of the detainment in the diagrams, the size of the two capacitive loops expanded by adding the concentration of *Annona squamosa* extract. This indicated that *Annona squamosa* extract enlarged the charge transfer resistance. The impedance spectra demonstrated a form of the low-frequency capacitive loop. The midpoint of the experimental arc was removed from below the axis.

The occurrence is possibly due to the relation to the surface heterogeneity because of the microscopic roughness of the electrode surface. In conclusion, *Annona squamosa* extract inhibits the corrosion of C38 steel in solutions and the expanding inhibiting properties that enlarge the concentration of the extract. The inhibition efficiency of *Annona squamosa* extract was directly affected by the temperature which led to an expansion

of the activation corrosion energy. This conceded a physical adsorption between the extract and the metal surface. The results from the obtained data demonstrate that from ac impedance technique, a frequency dispersion and thus leading to a modelling element with frequency dispersion behaviour.